BUSINESS PROCEDURE

Excavation & Penetration

HSE-PROC-126

This document applies to:

All Sites ☒

Table of Contents

1.0 Purpose/Scope

This Business Procedure defines Stanwell's minimum mandatory requirements for managing risks associated with excavation and penetration work. This procedure does not apply to mining and quarrying operations, nor tunnelling work.

This Business Procedure applies throughout Stanwell, its subsidiaries, and all activities under Stanwell's control. It applies to all employees and contractors of Stanwell and its subsidiaries, including visitors to Stanwell workplaces.

Where reasonable and practicable, additional or alternative requirements prescribed by a Client (where Stanwell or its subsidiary is engaged as a Contractor) must be adhered to, provided minimum legislative requirements are also satisfied

2.0 Actions

Where practicable, excavation and penetration work should be eliminated through design and planning. Where elimination is not possible, excavation and penetration risks must be managed using the hierarchy of controls to achieve the highest level of protection reasonably practicable under the circumstances.

When planning and undertaking excavation and penetration work it must be ensured:

- all personnel are trained and competent; and
- hazards are identified, and controls implemented and documented (as per Safe Work System (ePAS) requirements).

Where there is a risk of penetration or coming into contact with asbestos containing material, refer to *Asbestos Management Business Procedure (OHS-PROC-414)* and the relevant Asbestos Register.

Where there is a risk of coming into contact with live electrical components, refer to *Corporate Electrical Standard (ASM-STD-ENG-03)*.

3.0 Safe Work System Requirements

The Safe Work System must be implemented for:

- all excavations with a depth of 150mm or greater, or where damaging energies have been identified, for example, essential services; and
- all penetrations where the penetrating item (e.g. drill bit) will insert to a depth greater than the thickness of the primary surface (i.e. into a cavity) unless it can be confirmed there is no potential for services to exist behind or under the surface.

An occupied excavation must be assessed to determine confined space classification as per *Confined Space Business Procedure (OHS-PROC-14)* when:

- atmospheric testing or risk assessment indicates the potential for hazardous atmospheric conditions; and/or
- there is a risk of engulfment (for example water ingress).

A *Land and Vegetation Disturbance Permit* may be required prior to undertaking any activity that will result in ground or vegetation disturbance, for more information refer to *Land and Vegetation Disturbance Business Procedure (ENV-PROC-39)*.

3.1 Site Survey

Prior to undertaking excavation or penetration work, a documented Site Survey of the work area must be undertaken. A Site Survey template is generated as a Smart Document by the Safe Work System. Where the Safe Work System is not utilised, *Site Survey Results Record (T-3342)* can be utilised.

The purpose of the Site Survey is to identify:

- any services that may be affected;
- the location, depth, size and capacity/rating of any pipes, cables or plant associated with the services;
- any adjacent buildings or structures that may be affected;
- any restrictions on work activities imposed by the owner of a service; and
- nearby sensitive receivers (neighbours) that may be impacted by dust, noise or light associated with the work.

The completed Site Survey must be:

- attached to the Safe Work Authorisation or risk assessment for the work;
- communicated to the work party; and
- be kept available in the work area.

Prior to excavation or penetration work commencing, where applicable, the ground/wall/other area is to be marked (e.g. pressure paint spray, tape) to indicate safe areas where excavation and penetration can be undertaken and to clearly mark in a different way/colour, any services traversing the area.

3.2 Emergency Response

Sites must ensure there is a rescue/emergency response plan in place for the workplace to respond to excavation or penetration incidents, for example:

- ground slip;
- flooding;

- gas leaks;
- the rescue of workers in the event of an emergency;
- contact with essential / electrical services.

Specific requirements for emergency procedures and plans are detailed in *Emergency Response Framework Business Procedure (OHS-PROC-312)*.

Where the Safe Work Authorisation has identified the risk of an incident occurring that would require an emergency response or rescue, a *Rescue / Emergency Response Plan (T-3076)* must be developed and communicated to the work party.

4.0 Work Environment Requirements

4.1 Securing the Work Area

All excavations must be protected by barricading and signage to prevent unauthorised access, including inadvertent entry, so far as is reasonably practicable.

When securing the work area, it must be ensured:

- barriers are not installed in the 'Zone of Influence' of an excavation unless approved by a competent person (i.e. geotechnical/civil engineer);
- the stability of the excavation is assessed if using heavy barricading;
- signage is installed at locations surrounding the excavation to warn of hazards; and
- barricading and signage are used in accordance with *Barricading and Signage Business Procedure (OHS-PROC-134)*.

Prior to leaving an excavation or penetration unattended the following must be implemented:

- adequate barricading installed to prevent danger to pedestrians and vehicles;
- signage installed to clearly locate entry points; and
- where required, suitable lighting and reflective signage installed.

4.2 Adjacent Buildings or Structures

Excavation below the level of the footing of any structure (including retaining walls), or any penetration that could affect the stability of a structure, must be assessed by a competent person and secured by a ground support system designed by a competent person.

Work must not commence until controls are implemented to prevent the collapse or partial collapse of any potential affected building or structure.

Excavation or penetration work must not cause vibration, concussion, flooding or water ingress/inundation that could adversely affect adjacent buildings or structures.

4.3 Working Near Existing Essential Services

All reasonable steps must be taken to identify existing essential services in the work area, for example:

- by reviewing maps/drawings/plans and consultation with appropriately qualified personnel (e.g. electrician);
- undertaking a relevant site engineering report (e.g. civil, geotechnical);
- for excavation work, hand digging, potholing, utilising underground locators (e.g. ground penetrating radar) and/or obtaining information by contacting the 'Dial Before You Dig' service or relevant authorities;
- for penetration work, using the appropriate service detection/locating equipment and/or visual inspection.

Prior to work commencing, control measures must be implemented to eliminate contact with any existing services that have been identified, this may include isolation of the services for the duration of the work.

When undertaking potholing for excavation work, appropriate tools must be selected based on the energies identified in the risk assessment.

For excavation and penetration work, it must be ensured that:

- work only commences near a service once a competent person has declared it safe;
- mechanical plant is not used within 0.5m of live or active services; and
- damaged services are reported as soon as possible.

4.4 Falls and Falling Object Controls

Where there is a risk of a fall from one level to another where injury is likely or where there is a risk of falling objects, refer to *Work at Height Business Procedure (OHS-PROC-100)*.

Where a cover(s) is used to protect persons from falling into an excavation or penetration, it must be able to withstand the impact of any person who may stand or fall on it and be securely fixed in place to prevent it being moved or removed accidentally.

Toe boards must be installed around deep excavations where a risk assessment identifies the potential for falling objects.

5.0 Plant and Equipment Requirements

All plant and equipment used for excavation and penetration work is to be suitable for the intended purpose, meet legislative and relevant Australian Standard requirements, and be fit for purpose.

Powered mobile plant should not operate or travel near the edge of an excavation unless the ground support system installed has been designed by a competent person to carry such loads.

For further information on the management of powered mobile plant, refer to *Powered Mobile Plant Business Procedure (OHS-PROC-132)*.

Traffic management arrangements must be implemented when powered mobile plant is used for excavation work to prevent collision with persons and other mobile plant, for more information refer to *Traffic Management Business Procedure (OHS-PROC-130).*

6.0 Environment Controls

Waste must be segregated and disposed of in accordance with the site-specific Waste Management Business Procedure, and drains protected in accordance with the site-specific Water Management Plan. Disturbed soil should be managed to minimise sediment run-off entering drains and waterways or spreading across roadways and pedestrian paths.

Excavation work that has the potential to generate large volumes of dust, noise or light emissions that could impact sensitive receivers (i.e. neighbours, fauna, flora etc.) must have mitigation controls implemented.

7.0 Excavation Safe Work Practice Requirements

It must be ensured that:

- no person works alone in an excavation greater than 1.5 metres deep;
- if working in an excavation greater than 1.5 metres deep, the following applies;
    a. a competent and dedicated safety observer is assigned to continuously monitor the work area;
    b. the safety observer should preferably be in visual contact with the work team; and
    c. the safety observer must be located outside the Zone of Influence;
- excavation work stops immediately if any unexpected underground structure or service is encountered; and
- no loads are lifted above personnel working in excavations.

7.1 Inspections

A competent person must conduct a documented inspection of open excavation work areas (refer to *Daily Excavation Checklist T-3496*):

- before the start of each shift; and
- whenever site conditions change, e.g. heavy rain.

As a minimum, this inspection must review the:

- potential stability in the work area, including excessive edge loading;
- adequacy of the working space and access and egress for personnel in the excavation;
- adequacy of supports and barriers;
- soil condition;
- risks posed by and to adjacent work; and

- effectiveness of environmental controls.

7.2 Preventing Ground Collapse

Persons must not enter a trench greater than 1 metre deep, or an excavation where a risk assessment has identified a risk of injury due to ground collapse, unless one or more of the following controls are implemented:

- benching and/or battering with an angle of repose that does not exceed 45 degrees unless designed and certified in writing by a competent person i.e. geotechnical engineer;
- shoring or other positive ground support system designed by a competent person i.e. engineer;
- written advice is received from a competent person, i.e. geotechnical engineer, that all sides of the trench or excavation are safe from collapse.

When determining appropriate controls to prevent ground collapse, the following must be considered:

- soil classification and properties;
- location, depth and profile of excavation;
- moisture content of the soil;
- presence of groundwater, water seepage and water courses;
- weather impacts on site conditions; and
- adjacent operations.

All methods of ground support are to be designed in accordance with acceptable engineering principles and technical standards.

7.3 Access and Egress

It must be ensured:

- ladder access, or other safe means of access or egress, is provided for occupied excavations that cannot be easily walked into and out of;
- for trenches deeper than 1.5 metres where ladders are the sole means of access and egress, a ladder must be installed at intervals of no more than 9 metres along of the length of the trench;
- where ladder access is provided, ladders must extend at least one metre above the edge of the excavation and are installed in accordance with *Work at Height - Stay Safe (OHS-PROC-100C);*
- emergency services can access the work area in the event of an emergency.

7.4 Wet Conditions

Where the ground within or adjacent to an excavation is waterlogged, or water is present within the excavation, a competent person must assess and determine the need for controls. Surface water or runoff must be diverted or controlled to prevent accumulation in an excavation.

7.5 Exclusion Zones

The following is applicable when undertaking excavation work:

- a competent person must determine the Zone of Influence around each excavation;
- plant, vehicles, storage of materials, including excavated material, or any other heavy loads must not be located within the Zone of Influence unless the ground support system installed has been designed by a competent person, for example a geotechnical engineer, to carry such loads; and
- specific controls must be implemented to ensure approach distances for overhead powerlines are maintained.

7.6 Atmospheric Conditions

The risk of atmospheric contamination through a build-up of gases and fumes must be controlled in excavation work; including for potential gases, sulphur dioxide, engine fumes, carbon monoxide and carbon dioxide, and leakage from gas bottles, fuel tanks, sewers, drains, gas pipes and LPG tanks.

For occupied excavations it must be ensured:

- a safe atmosphere is maintained;
- plant is not located where exhaust fumes could create hazardous atmospheric conditions; and
- regular inspection undertaken to ensure no additional hazards are present or introduced that may impact atmospheric conditions e.g. hazardous chemicals, gases or organic matter.

For work involving hazardous chemicals, refer to *Hazardous Chemicals Business Procedure (OHS-PROC-128).*

7.7 Installation or Modification of Underground Services

Where services are installed or modified underground, those services must be filled with appropriate material, for example sand, and appropriate colour coded tape used in accordance with *AS/NZS 2648.1:1995 Underground marking tape*.

Underground Service	Tape Colour
Electricity	Orange
Gas	Yellow
Water	Green
Communications	White
Fire fighting	Red
Sewerage	Cream
Reclaimed Water	Purple

Underground essential services colour coding based on AS/NZS 2648.1:1995

Site service drawings/maps must be updated to identify the installation or modification to any services.

8.0 Penetration Safe Work Practice Requirements

It must be ensured:

- penetration work is stopped and investigated where unexpected conditions are encountered, for example, rapid overheating and/or dulling of saw blades or drill bits, slow drilling or cutting, or metal shavings where drywall dust is expected;
- a structural assessment by an engineer is completed before any penetration that could cause structural damage or weaken a structure, such as any penetrations in a reinforced concrete wall, ceiling or floor;
- a pilot hole is considered for penetrations into hollow structures to enable visual inspection for hidden services;
- flammable and/or explosive risk is considered when undertaking penetration work, and where required, controls implemented in accordance with *Hot Work Business Procedure (OHS-PROC-128)*.
- the *National Construction Code (NCC) C3.15 Penetrations of walls, floors and ceilings by services* is referred to prior to the installation of services that penetrate a fire-rated wall, floor or ceiling.

9.0 Training and Competency Requirements

All personnel involved in excavation and penetration work are to be trained and competent as per Stanwell and legislative requirements.

10.0 Review, Consultation and Communication

Review:

This document is required to be reviewed, as a minimum, every 5 years, or more frequently if required through change in Legislation, Australian Standards or workplace practices.

Consultation:
Personnel consulted/communicated with during the review of this document include relevant HSE teams and site HSE committees (if operational processes change) as well as any other personnel who have an interest in the process.

Communication/Requirements after Update:
This Business Procedure will be communicated on GenNet.

11.0 References

- Environmental Protection Act 1994
- Environmental Protection Regulation 2019
- Work Health and Safety Act 2011
- Work health and Safety Regulation 2011
- GOC State Archives – Public Records Act
- Queensland Excavation Work Code of Practice 2021
- AS/NZS 2648.1:1995 Underground marking tape
- National Construction Code (NCC) C3.15 Penetrations of walls, floors and ceilings by services

Document No	Document Title
OHS-PROC-414	Asbestos Management
OHS-PROC-134	Barricading & Signage
OHS-PROC-18	Confined Space
ASM-STD-ENG-03	Corporate Electrical Standard
OHS-PROC-312	Emergency Response Framework
HSE-PROC-126A	Excavation & Penetration Stay Safe
OHS-PROC-128	Hazardous Chemicals
OHS-PROC-128	Hot Work
ENV-PROC-39	Land & Vegetation Disturbance
OHS-PROC-132	Powered Mobile Plant
OHS-PROC-130	Traffic Management
OHS-PROC-100	Work at Height
OHS-PROC-100A	Work at Height Stay Safe
T-3496	Daily Excavation Checklist
T-3076	Rescue / Emergency Response Plan

T-3342	Site Survey Results Record

12.0 Definitions

Word / Abbreviation	Definition
Battering	To form the face or side or wall of an excavation to an angle, usually less than the natural angle of repose, to prevent earth slippage.
Benching	The horizontal stepping of the face, side, or wall of an excavation.
Competent Person	A person who has, through a combination of training, education and experience, acquired knowledge and skills enabling that person to perform correctly the specified task.
Dial Before You Dig	A free enquiry service for information on underground assets anywhere in Australia that can be contacted by phoning 1100 or submitting an online website enquiry (www.1100.com.au).
Excavation	A hole in the earth or face of the earth, including a trench.
Excavation Work	Moving earth to: • make an excavation; or • fill or partly fill an excavation. Excavation work does not include the digging or movement of material stockpiles (such as coal and topsoil), the digging of raised garden beds, cleaning of culverts around drains to the natural ground shape, etc.
Essential Services	Includes the supply of gas, water, sewage, telecommunications, electricity, chemicals, fuel and refrigerant in pipes or lines.
Fire-rated walls, floors and ceilings	Building elements designed to resist the spread of fire for a specified duration, typically measure in minutes.
Penetration	Any activity that penetrates the integral surface of a building or structure (such as walls, floors, ceiling or electrical panels) through methods like drilling, coring, sawing, cutting, screwing, nailing or jackhammering.
Potholing	Digging with hand tools to a pre-determined depth to verify if assets exist in the immediate location. Insulated hand digging tools suitable for the voltage concerned may be used or a vacuum pumping in the potholing process may also be used to locate an underground cable.
Trench	A horizontal or sloped opening in the ground that is longer than it is wide, with a depth equal to or less than its width.
Zone of Influence	The volume of soil around an excavation affected by any external load, for example, vehicles, plant, and excavated material.

12.1 Revision History

Rev. No.	Rev. Date	Revision Description	Author	Endorse/Check	Approved By
0	14.08.14	Document created to reflect corporate wide process	J. Paull	T. Hooper	I. Gilbar
1	01.06.2020	Scheduled Review	J. Fullard	J. Paull	K. Ussher
Previously number OHS-PROC-126. Renumber to HSE-PROC-126					
0	25.06.2025	Scheduled full review; refer to HSE Advice 202508A.	Jayde Smith	Carel Rothman	Kriss Ussher

13.0 Appendices

13.1 Appendix A: Excavation & Penetration Document Flowchart